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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/010,572	11/09/2001	Carl Cavanagh	5181-97900	4344

7590 07/28/2005

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EXAMINER	
SHARON, AYAL I	

ART UNIT	PAPER NUMBER
2123	0

DATE MAILED: 07/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/010,572	CAVANAGH ET AL.	
	Examiner	Art Unit	
	Ayal I. Sharon	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 November 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2/25/02, 4/7/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Introduction

1. Claims 1-33 of U.S. Application 10/010,572 filed on 11/09/2001 are presented for examination.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 15-23 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.
4. Regarding independent claims 15-23, the claim recites "A carrier medium comprising instructions" with the apparent claim limitations describing non-functional aspects of the object definition. Additionally, the claim lacks a positive recitation that what is claimed is a carrier medium having executable computer code that when executed causes a computer to perform the steps described by the claim limitations. As currently written, the claimed computer program and storage medium appears to consist of non-functional descriptive material; see MPEP § 2106, subsection IV.B.1(a).
5. In addition, "a carrier medium comprising instructions" is a limitation that is sufficiently broad to include air or electro-magnetic fields as "carrier media". Air

and electro-magnetic fields are "manifestations of nature", and therefore are not patentable. See MPEP § 2105 and *Diamond v. Chakrabarty*, 447 U.S. 303, 206 USPQ 193 (1980).

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. The prior art used for these rejections is as follows:

8. Dearth, G. A., U.S. Patent 5,907,695. (Henceforth referred to as "**Dearth**").

9. The claim rejections are hereby summarized for Applicant's convenience. The detailed rejections follow.

10. Claims 1-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Dearth.

11. In regards to Claim 1, Dearth teaches the following limitations:

1. A distributed simulation system comprising a plurality of nodes,

wherein each node of the plurality of nodes is configured to simulate a different portion of a system under test using a simulator program configured to perform a simulation as a series of timesteps, and

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

wherein each timestep includes at least a first phase and a second phase, and

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

Dearth teaches (see col.3, lines 41-44): "A single bus has one or more signal pathways between two or more circuit parts of a simulated circuit which are accessed according to a common clock signal."

Examiner finds it inherent that a clock signal cycle has at least a first phase and a second phase. Examiner also finds that a timestep corresponds to a clock signal cycle.

> wherein each node of the plurality of nodes is configured not to cause the simulator program to evaluate a model of the different portion of the system under test during the first phase even if one or more commands are received by that node during the first phase, and

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

Dearth teaches (see col.3, lines 44-51): "Each VBS has one of four states, namely, reap running, reap stopped, post running, post stopped. When a VBS posts, it is determined whether any other VBS of the same zone has yet to reap a previously resolved simulated bus state. If such a VBS exists, the posting VBS moves from reap running state to a post stopped state and execution of the simulation system containing the posting VBS is suspended."

> wherein each node of the plurality of nodes is configured to cause the simulator program to evaluate the model during the second phase in response to receiving a command including one or more signal values for signals of the model.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

Dearth teaches (see col.3, lines 56-62): "When the last VBS of a zone reaps the previously resolved simulated bus state, all simulation systems which contain VBSs of the zone in a post stopped state, i.e., simulation systems whose execution is suspended, are awakened, i.e., execution of such simulation systems is resumed. In addition, each of the VBSs of the zone in the post stopped state move to the post running state."

12. In regards to Claim 2, Dearth teaches the following limitations:

> 2. The distributed simulation system as recited in claim 1 wherein each node of the plurality of nodes is configured not to cause the simulator program to evaluate the model during the second phase if the signal values in the command received by that node are the same as the current values of the signals.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

Dearth teaches (see col.3, lines 44-51): "Each VBS has one of four states, namely, reap running, reap stopped, post running, post stopped. When a VBS posts, it is determined whether any other VBS of the same zone has yet to reap a previously resolved simulated bus state. If such a VBS exists, the posting VBS moves from reap running state to a post stopped state and execution of the simulation system containing the posting VBS is suspended."

13. In regards to Claim 3, Dearth teaches the following limitations:

> 3. The distributed simulation system as recited in claim 1 wherein each node of the plurality of nodes is configured, if one or more output signals of the model change in response to evaluating the model, to transmit a command including at least the signal values of the output signals that change.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

14. In regards to Claim 4, Dearth teaches the following limitations:

> 4. The distributed simulation system as recited in claim 1 wherein each node of the plurality of nodes is configured to cause the simulator program to evaluate the model two or more times during the second phase in response to two or more commands including signal values.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

15. In regards to Claim 5, Dearth teaches the following limitations:

> 5. The distributed simulation system as recited in claim 1 further comprising a hub coupled to the plurality of nodes, wherein the hub is configured to receive at least one command from each node during the first phase prior to transmitting commands to the plurality of nodes during the first phase.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

16. In regards to Claim 6, Dearth teaches the following limitations:

> 6. The distributed simulation system as recited in claim 5 wherein each node of the plurality of nodes is configured to transmit a no-operation command to the hub if that node has no other command to transmit.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

17. In regards to Claim 7, Dearth teaches the following limitations:

> 7. The distributed simulation system as recited in claim 5 wherein the hub is configured to transmit at least one command to each node of the plurality of nodes.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

18. In regards to Claim 8, Dearth teaches the following limitations:

> 8. The distributed simulation system as recited in claim 7 wherein a first command transmitted by the hub to a first node of the plurality of nodes corresponds to a second command received from one of the plurality of nodes if the second command is routed to the first node; and wherein the first command is a no-operation command otherwise.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

19. In regards to Claim 9, Dearth teaches the following limitations:

> 9. The distributed simulation system as recited in claim 1 further comprising a hub coupled to the plurality of nodes, wherein the hub is configured to receive at least one command from each node during the second phase prior to transmitting commands to the plurality of nodes during the second phase.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

20. In regards to Claim 10, Dearth teaches the following limitations:

> 10. The distributed simulation system as recited in claim 9 wherein each node of the plurality of nodes is configured to transmit a no-operation command to the hub if that node has no other command to transmit.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

21. In regards to Claim 11, Dearth teaches the following limitations:

> 11. The distributed simulation system as recited in claim 9 wherein the hub is configured to transmit at least one command to each node of the plurality of nodes.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

22. In regards to Claim 12, Dearth teaches the following limitations:

> 12. The distributed simulation system as recited in claim 11 wherein a first command

transmitted by the hub to a first node of the plurality of nodes corresponds to a second command received from one of the plurality of nodes if the second command is routed to the first node, and wherein the first command is a no-operation command otherwise.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

23. In regards to Claim 13, Dearth teaches the following limitations:

13. The distributed simulation system as recited in claim 1 further comprising a hub coupled to the plurality of nodes and configured to signal an end of each of the first phase and the second phase.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

24. In regards to Claim 14, Dearth teaches the following limitations:

14. The distributed simulation system as recited in claim 13 wherein the hub is configured to receive at least one command from each node prior to transmitting commands to the plurality of nodes, and wherein the hub is configured to signal an end to one of the first phase or the second phase responsive to receiving a no-operation command from each of the plurality of nodes.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

25. In regards to Claim 15, Dearth teaches the following limitations:

15. A carrier medium comprising instructions which, when executed, process a first one or more commands received during a first phase of a timestep without causing a simulator program to evaluate a model, and cause the simulator program to evaluate the model during a second phase of the timestep in response to receiving a second command including one or more signal values for signals of the model.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

26. In regards to Claim 16, Dearth teaches the following limitations:

16. The carrier medium as recited in claim 15 wherein the instructions, when executed, do not cause the simulator program to evaluate the model during the second phase if the signal values in the second command are the same as the current values of the signals in the model.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

27. In regards to Claim 17, Dearth teaches the following limitations:

17. The carrier medium as recited in claim 15 wherein the instructions, when executed, if one or more output signals of the model change in response to evaluating the model, transmit a command including at least the signal values of the output signals that change.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

28. In regards to Claim 18, Dearth teaches the following limitations:

18. The carrier medium as recited in claim 17 wherein the instructions, when executed, if no output signals change value during the second phase, transmit a no-operation command.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

29. In regards to Claim 19, Dearth teaches the following limitations:

19. The carrier medium as recited in claim 15 wherein the instructions, when executed, cause the simulator program to evaluate the model two or more times during the second phase in response to two or more commands including signal values and optional signal strengths.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

30. In regards to Claim 20, Dearth teaches the following limitations:

20. The carrier medium as recited in claim 15 wherein, in response to a third command indicating an end of the first or second phase, is configured to return to the simulator program.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

31. In regards to Claim 21, Dearth teaches the following limitations:

21. A carrier medium comprising instructions which, when executed, are configured to signal an end of either a first phase or a second phase of a timestep in a distributed simulation system by transmitting a predefined command indicating an end of the first phase or the second phase to each of a plurality of nodes in the distributed simulation system.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

32. In regards to Claim 22, Dearth teaches the following limitations:

22. The carrier medium as recited in claim :Z1 wherein the instructions are configured to signal the end of either the first phase or the second phase responsive to receiving a no-

operation packet from each of the plurality of nodes subsequent to transmitting a command other than a no-operation packet to at least one of the plurality of nodes.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

33. In regards to Claim 23, Dearth teaches the following limitations:

23. The carrier medium as recited in claim :Z1 wherein the instructions route commands from one of the plurality of nodes to others of the plurality of nodes.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

34. In regards to Claim 24, Dearth teaches the following limitations:

24. A method comprising:

receiving a first one or more commands in a node of a distributed simulation system during a first phase of a timestep;

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

processing the first one or more commands without causing a simulator program to evaluate a model;

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

receiving a second command during a second phase of the timestep; and

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

processing the second command including causing the simulator program to evaluate the model if the second command includes one or more signal values for signals of the model.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

35. In regards to Claim 25, Dearth teaches the following limitations:

25. The method as recited in claim 24 wherein processing the second command does not include causing the simulator program to evaluate the model if the signal values in the second command are the same as the current values of the signals in the model.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

36. In regards to Claim 26, Dearth teaches the following limitations:

> 26. The method as recited in claim 24 further comprising, if the evaluation of the model during the second phase results in one or more output signals of the model changing, transmitting a command including at least the signal values of the output signals that change.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

37. In regards to Claim 27, Dearth teaches the following limitations:

> 27. The method as recited in claim 26 fiurther comprising, if no output signals change value during the second phase, transmitting a no-operation command.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

38. In regards to Claim 28, Dearth teaches the following limitations:

> 28. The method as recited in claim 24 further comprising causing the simulator program to evaluate the model two or more times during the second phase in response to two or more commands including signal values.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

39. In regards to Claim 29, Dearth teaches the following limitations:

> 29. The method as recited in claim 24 further comprising, in response to a command indicating an end of the first or second phase, returning to the simulator program.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

40. In regards to Claim 30, Dearth teaches the following limitations:

> 30. A method comprising;
>
> signaling an end of a first phase of a timestep in a distributed simulation system by a hub of the distributed simulation system,
>
> the signaling including transmitting a predefined command to each of a plurality of nodes in the distributed simulation system; and

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

Dearth teaches (see col.3, lines 44-51): "Each VBS has one of four states, namely, reap running, reap stopped, post running, post stopped. When a VBS posts, it is determined whether any other VBS of the same zone has yet to reap a previously resolved simulated bus state. If such a VBS exists, the posting VBS moves from reap running state to a post stopped state and execution of the simulation system containing the posting VBS is suspended."

> signaling an end of a second phase of a timestep in a distributed simulation system by the hub,
>
> the signaling including transmitting a predefined command to each of the plurality of nodes in the distributed simulation system.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

Dearth teaches (see col.3, lines 56-62): "When the last VBS of a zone reaps the previously resolved simulated bus state, all simulation systems which contain VBSs of the zone in a post stopped state, i.e., simulation systems whose execution is suspended, are awakened, i.e., execution of such simulation systems is resumed. In addition, each of the VBSs of the zone in the post stopped state move to the post running state."

41. In regards to Claim 31, Dearth teaches the following limitations:

> 31. The method as recited in claim 30 wherein signaling the end of the first phase is responsive to receiving a no-operation packet from each of the plurality of nodes subsequent to transmitting a command other than a no-operation packet to at least one of the plurality of nodes.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

42. In regards to Claim 32, Dearth teaches the following limitations:

> 32. The method as recited in claim 30 wherein signaling the end of the second phase is responsive to receiving a no-operation packet from each of the plurality of nodes subsequent to transmitting a command other than a no-operation packet to at least one of the plurality of nodes.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

43. In regards to Claim 33, Dearth teaches the following limitations:

> 33. A distributed simulation system comprising a plurality of nodes wherein each node of the plurality of nodes is configured to simulate a different portion of a system under test using a simulator program configured to perform a simulation as a series of timesteps,

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

Dearth teaches (see col.3, lines 41-44): "A single bus has one or more signal pathways between two or more circuit parts of a simulated circuit which are accessed according to a common clock signal."

Examiner finds it inherent that a clock signal cycle has at least a first phase and a second phase. Examiner also finds that a timestep corresponds to a clock signal cycle.

and wherein the plurality of nodes are configured to communicate using commands,

(See Dearth, especially: col.3, line 20 – col.4, line 28; and the state diagram in Fig.3 and associated text)

and a first node of the plurality of nodes is configured to cause the simulator program to evaluate the model in response to receiving a first command including one or more signal values for signals of the model during a first timestep, and

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

Dearth teaches (see col.3, lines 44-51): "Each VBS has one of four states, namely, reap running, reap stopped, post running, post stopped. When a VBS posts, it is determined whether any other VBS of the same zone has yet to reap a previously resolved simulated bus state. If such a VBS exists, the posting VBS moves from reap running state to a post stopped state and execution of the simulation system containing the posting VBS is suspended."

wherein the first node is configured to cause the simulator program to re-evaluate the model in response to receiving a second command including one or more signal values for signals of the model during the first timestep.

(See Dearth, especially: col.3, line 20 – col.4, line 28; and Fig.5, Items 208A-C and associated text)

Dearth teaches (see col.3, lines 56-62): "When the last VBS of a zone reaps the previously resolved simulated bus state, all simulation systems which contain VBSs of the zone in a post stopped state, i.e., simulation systems whose execution is suspended, are awakened, i.e., execution of such simulation systems is resumed. In addition, each of the VBSs of the zone in the post stopped state move to the post running state."

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ayal I. Sharon whose telephone number is (571) 272-3714. The examiner can normally be reached on Monday through Thursday, and the first Friday of a biweek, 8:30 am – 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Picard can be reached at (571) 272-3749.

Any response to this office action should be faxed to (571) 273- 8300, or mailed to:

USPTO
P.O. Box 1450
Alexandria, VA 22313-1450

or hand carried to:

USPTO
Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Tech Center 2100 Receptionist, whose telephone number is (571) 272-2100.

Paul L. Rodriguez 7/22/05
Primary Examiner
Art Unit 2125

Ayal I. Sharon

Art Unit 2123

July 22, 2005